Acute toxicity of RPA 412708 to Rainbow trout (*Oncorhyncus mykiss*) MRID 45385731

Data Requirement:		
	PMRA DATA CODE	{.....}
	EPA DP Barcode	D275213
	OECD Data Point	Mortality
	EPA MRID	45385731
	EPA Guideline	72-1

Test material: RPA 412708 **Purity:** >98 %
Common name: S-Enantionmer of RPA 408056; Degradate of Fenamidone, PC 046679
Chemical name: IUPAC: None
CAS name: (S)-5-Methyl-2-methylthio-5-phenyl-3,5-dihydroimidazol-4-one
CAS No.: Not reported
Synonyms: Not reported

Primary Reviewer: Dana Worcester, M.S. **Signature:**
Staff Scientist, Dynamac Corporation **Date:** 1/15/02

QC Reviewer: Teri Myers, Ph.D. **Signature:**
Staff Scientist, Dynamac Corporation **Date:** 1/15/02

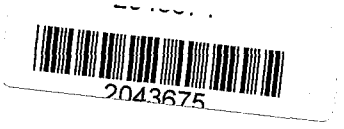
EPA Reviewer: James J Goodyear **Date:** 9/16/2
James J. Goodyear, Ph.D.
OPP/EFED/ERB3

EPA Secondary Reviewer: **Date:** 9/10/02
Henry T. Craven Henry Craven
OPP/EFED/ERB3

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
EPA PC Code 046679

Date Evaluation Completed: {dd-mmm-yyyy}

CITATION: Odin-Feurtet, M. 1998. **RPA 412708 (S-Enantiomer of RPA 408056)**: Acute Toxicity (96 hours) to Rainbow Trout (*Oncorhyncus mykiss*) Under Static Conditions. Unpublished study performed by Rhône-Poulenc, Sophia Antipolis, Cedex and sponsored by Rhône-Poulenc, Lyon, Cedex. Project ID: SA 98317. Completed December 4, 1998.



Data Evaluation Report on the acute toxicity of RPA 412708 (S-Enantiomer of RPA 408056) to Rainbow trout (*Oncorhyncus mykiss*)

PMRA Submission Number {.....} EPA MRID Number 45385731

Data Requirement:

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CAS No.: Not reported
Synonyms: Not reported

Primary Reviewer: Dana Worcester, M.S. **Signature:** Dana Worcester
Staff Scientist, Dynamac Corporation **Date:** 1/15/02

QC Reviewer: Teri Myers, Ph.D. **Signature:** T. S. Myers
Staff Scientist, Dynamac Corporation **Date:** 1/15/02

Primary Reviewer: {James J. Goodyear, Ph.D. US EPA, Mail Code 7507C 1200 Pennsylvania Ave. NW Washington, DC 20460} **Date:** {5/2/2}
{EPA/OECD/PMRA} James J. Goodyear

Secondary Reviewer(s): {.....} **Date:** {.....}
{EPA/OECD/PMRA}

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
EPA PC Code 046679

Date Evaluation Completed: {dd-mmm-yyyy}

CITATION: Odin-Feurtet, M. 1998. RPA 412636 (S-Enantiomer of RPA 717879): Acute Toxicity (96 hours) to Rainbow Trout (*Oncorhyncus mykiss*) Under Static Conditions. Unpublished study performed by Rhône-Poulenc, Sophia Antipolis, Cedex and sponsored by Rhône-Poulenc, Lyon, Cedex. Project ID: SA 98317. Completed December 4, 1998.

EXECUTIVE SUMMARY:

The 96-h acute toxicity study of RPA 412708, the S-Enantiomer of RPA 408056, was studied under static conditions. Rainbow trout (*Oncorhynchus mykiss*) were exposed to a dilution water control and 5 nominal test concentrations of RPA 412708 at 6.3, 12.5, 25, 50, and 100 mg a.i./L for 96 hours. The mean measured concentrations of RPA 412708 were 6.2, 12.3, 24, 49, and 98 mg a.i./L. The 96-h LC_{50} exceeded the highest test concentration, 98 mg a.i./L. The NOAEC was 12.3 mg a.i./L, based on sublethal signs of toxicity, such as lethargy. Based on these results, RPA 412708 is categorized as slightly toxic to rainbow trout on an acute toxicity basis.

This toxicity study is classified as Core and satisfies the guideline requirements for this degradate of fenamidone for an acute freshwater fish toxicity study (EPA-540/9-85-006, 72-1) .

Results Synopsis

Test Organism Size/Age(mean Weight or Length): 0.98 g.; 4.84 cm.
Test Type (Flow-through, Static, Static Renewal): Static
LC_{50}: >98 mg a.i./L 95% C.I.: N/A
NOAEC: 12.3 mg a.i./L (based on sublethal effects)
Probit Slope: N/A
EC_{50}: Not reported
Endpoint(s) Affected: Sublethal effects such as erratic swimming, lethargy and pigmentation disorders.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The study was conducted in accordance with guidelines formulated by the OECD; Data requirements followed OECD Guideline No. 203

Deviations included the following:

1. Control and test vessels were exposed to gentle aeration. US EPA does not recommend the aeration of the test solutions.
2. The acclimation period (12 days) was slightly shorted than required by EPA guidelines (14 days).
3. The biomass loading rate was not reported.

COMPLIANCE: Signed and dated GLP, Quality Assurance and Confidentiality statements were provided.

A. MATERIALS:

1. Test Material RPA 412708

Description: White Powder

Lot No./Batch No. : BESS0560

Purity: >99.8 %

Stability of Compound Under Test Conditions: Test concentrations were stable over the course of the study. Measured concentrations after 96 hours ranged from 88-100% of measured concentrations at time 0.
(OECD requires water solubility, stability in water and light, pKa, Pow, vapor pressure of test compound)

Storage conditions of test chemicals: The test substance was stored at room temperature in the dark.

2. Test organism:

Species: Rainbow trout (*Oncorhynchus mykiss*)
EPA requires a coldwater species (preferably rainbow trout *Oncorhynchus mykiss*) and a warmwater species (preferably bluegill sunfish *Lepomis macrochirus*).
OECD allows choice of species at discretion of testing laboratory.
Age at test initiation: Not reported
Weight at study initiation: 0.91 - 1.11 g
EPA requires: mean 0.5 - 5 g
Length at study initiation: 4.6 - 5.0 cm
EPA requires: Longest not > 2x shortest; OECD requires 2.0 ± 1.0 cm for bluegill and 5.0 ± 1.0 cm for

rainbow trout
Source: Bio International (A.R.O.), Hampton, NH

B. STUDY DESIGN:

1. Experimental Conditions

a) Range finding Study

A 96 hour exposure test was conducted prior to the definitive study. Following 48 hours of exposure to a single nominal concentration of 100 mg a.i./L, no mortality was observed, but pigmentation disorders were observed.

b) Definitive Study

Table 1 . Experimental Parameters

Parameter	Details	Remarks Criteria
Acclimation: period: conditions: (same as test or not)	 12 days Same as test	
Feeding: Health: (any mortality observed)	Not fed 24-hours prior to test initiation; not fed during exposure <5% mortality 48 hours prior to the test	*EPA requires: minimum 14 days; no feeding during test OECD requires minimum of 12 days.*
Duration of the test	96-hour	*(EPA/OECD requires: 96 hour)*
Test condition static/flow through	 Static	
Type of dilution system- for flow through method. Renewal rate for static renewal	N/A N/A	*(EPA requires: Must provide reproducible supply of toxicant) (EPA requires: Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period*
Aeration, if any	Air bubbling	*(EPA requires: no aeration; OECD permits aeration)*

Parameter	Details	Remarks Criteria
Test vessel Material: (glass/stainless steel) Size: Fill volume:	 Glass 30 L 30 L	 *EPA requires: Size 19 L (5 gal) or 30 x 60 x 30 cm* *Fill volume: 15-30 L of solution*
Source of dilution water Quality:	Tap water filtered through activated charcoal and diluted with reverse osmosed deionized water	*(EPA 1975; Soft reconstituted water or water from a natural source, **not** dechlorinated tap water); OECD permits dechlorinated tap water.*

Parameter	Details	Remarks Criteria
Water parameters: Hardness pH Dissolved oxygen Total Organic carbon Particulate Matter Metals Pesticides Chlorine Temperature {Salinity for marine or estuarine species} Intervals of water quality measurement	 41 mg/L $CaCO_3$ 7.4 - 7.8 8.8-9.6 mg/L <1 mg/L <1 mg/L Below detection limit Below detection limit Not reported 14.5 - 15.1°C N/A DO, pH, and temperature were measured daily.	Analysis pp. 35-37 *(EPA hardness: 40 - 48 mg as $CaCO_3$/L; OECD allows 10 -250 mg as $CaCO_3$/L)* *(EPA pH: 7.2 - 7.6; 8.0-8.3 for marine-stenohaline fishes, 7.7-8.0 for estuarine-euryhaline fishes, monthly range < 0.8);* *OECD allows pH 6.0 - 8.5* (EPA Dissolved Oxygen: *Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%); OECD requires at least 80% saturation value.* *(EPA temperture: estuarine/marine: 22 ± 1 °C* *OECD requires 21 - 25°C for bluegill and 13 - 17°C for rainbow trout* *(EPA salinity: 30-34 ‰ (parts per thousand) salinity, weekly range < 6 ‰)* *(EPA water quality: measured at beginning of test and every 48 hours)*
Number of replicates/groups: control: solvent control: treated ones:	 1 N/A 1	*(EPA/OECD requires: Control & 5 treatment levels; each conc. should be 60% of the next highest conc.; concentrations should be in a geo-metric series)*

Parameter	Details	Remarks Criteria
Number of organisms per replicate /groups: control: solvent control: treated ones:	 10 N/A 10	*(EPA: ≥ 10/concentration); OECD requires at least 7 fish/concentration*
Biomass loading rate	Not reported	*Static: ≤ 0.8 g/L at ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day; OECD requires maximum of 1 g fish/L for static and semi-static with higher rates accepted for flow-through*
Test concentrations: nominal: measured:	 6.3, 12.5, 25, 50, 100 mg a.i./L 6.2, 12.3, 24, 49, 98 mg a.i./L	
Solvent (type, percentage, if used)	N/A	*EPA requires: Not to exceed 0.5 ml/L for static tests or 0.1 ml/L for flow-through tests; OECD requires solvent , exceed 100 mg/L.*
Lighting	16:8	*(EPA requires: 16 hours light/8 hours dark); OECD requires 12 -16 hours photoperiod.*
Feeding	Not fed 24-hour prior to study or during exposure	*EPA/OECD requires: No feeding during the study*
Recovery of chemical Level of Quantitation Level of Detection	90-105% 100 µ/L Not reported	
Positive control {if used, indicate the chemical and concentrations}	N/A	
Other parameters, if any	N/A	

2. Observations:

Table 2: Observations

Criteria	Details	Remarks/Criteria
Parameters measured including the sublethal effects/toxicity symptoms	Mortality and symptoms of toxicity	
Observation intervals	3, 24, 48, 72 and 96 hours of exposure	*(EPA/OECD requires: minimally every 24 hours)*
Were raw data included?	Yes	
Other observations, if any	N/A	

II. RESULTS and DISCUSSION:

A. MORTALITY:

After 96 hours, no mortality was observed.

Table 3: Effect of RPA 412708 on mortality of Rainbow trout (*Oncorhyncus mykiss*).

Treatment nominal and (Mean measured) concentrations (mg a.i./L)	No. of fish at start of study	Observation period									
		Hour 0-4		Day 1		Day 2		Day 3		Day 4	
		No Dead	% mortality	No Dead	% mortality	No Dead	% mortality	No Dead	% mortality	No Dead	% mortality
Control (dilution water only)	10	0	0	0	0	0	0	0	0	0	0
Solvent control	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6.3 (6.2)	10	0	0	0	0	0	0	0	0	0	0
12.5 (12.3)	10	0	0	0	0	0	0	0	0	0	0
25 (24)	10	0	0	0	0	0	0	0	0	0	0
50 (49)	10	0	0	0	0	0	0	0	0	0	0
100 (98)	10	0	0	0	0	0	0	0	0	0	0
NOAEC	98 mg a.i./L										
LC_{50}	>98 mg a.i./L										
Positive control, if used mortality: LC_{50}:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

B. NON-LETHAL TOXICITY ENDPOINTS:

Sublethal effects, including lethargy, erratic swimming and pigmentation disorders were observed in fish from the 24, 49, and 98 mg a.i./L treatment groups.

Table 4. Sub-lethal effect of RPA 412708 on Rainbow trout (*Oncorhyncus mykiss*).

Treatment nominal and (Mean measured) concentrations (mg a.i./L)	Observation period				
	endpoint at Hour 4	endpoint at Day 1	endpoint at Day 2	endpoint at Day 3	endpoint at Day 4
	% affected	% affected*	% affected*	% affected*	% affected*
Control (dilution water only)	0	0	0	0	0
Solvent control	N/A	N/A	N/A	N/A	N/A
6.3 (6.2)	0	0	0	0	0
12.5 (12.3)	0	0	0	0	0
25 (24)	0	0	60	70	50
50 (49)	0	0	50 - 70	80	60
100 (98)	0	100	100	100	100
NOAEC	12.3 mg a.i./L				
LOAEC	24 mg a.i./L				
EC_{50}	Not reported				
Positive control, if used % sublethal effect: EC_{50}:	N/A	N/A	N/A	N/A	N/A

* Author provided number of fish, reviewer calculated percent.

C. REPORTED STATISTICS:

No statistical analysis could be performed.

D. VERIFICATION OF STATISTICAL RESULTS:

No statistical analyses were performed because there was no mortality during the study.

LC_{50}: >98 mg/L 95% C.I.: N/A
NOAEC: 12.3 mg/L Slope: N/A

E. STUDY DEFICIENCIES:

Although the test vessels were aerated the recovery of fenamidone was sufficient to demonstrate that exposure was adequate to sustain the validity of the study. (See second paragraph in reviewers comments section below).

F. REVIEWER'S COMMENTS:

The reviewer's conclusions were identical to the study authors. The 96-h LC_{50} exceeded the highest test concentration, 98 mg a.i./L. The NOAEC was 12.3 mg a.i./L, based on sublethal signs of toxicity, such as lethargy. There was no mortality in this study. Based on these results, RPA 412708 is categorized as slightly toxic to rainbow trout on an acute toxicity basis.

One static stability study with RPA 412708 was conducted in order determine the stability of the test substance under aerated conditions for the duration of the definitive study. The 96-hour aerated static test was carried out using a nominal concentration of 100 mg a.i./L. Following 96 hours, RPA 412708 appeared stable with recovery of 100% of the nominal concentration. In the definitive study the initial measured concentrations were 98 - 100% of nominal and at the terminal concentrations were 88-100% of nominal.

G. CONCLUSIONS:

This study is classified as Core for this degradate of fenamidone and fulfills EPA guidelines 72-1. The LC_{50} was >98 mg a.i./L and the NOAEC was 12.3 mg/L, based on sublethal effects. As a result, RPA 412708 is classified as no more than slightly toxic to rainbow trout *(Oncorhynchus mykiss)* according to the classification system of the U.S. EPA.

LC_{50}: >98 mg a.i./L 95% C.I.: Not reported
NOAEC: 12.3 mg a.i./L

III. REFERENCES:

E.E.C. 1992. Annex to Commission Directive 92/69/E.E.C. of 31/07/92 - Part C, Methods of Determination of Ecotoxicity - Method C1: Acute Toxicity for Fish. Official Journal of European Communities. Publication L 383 A, pp. 163-171.

OECD. 1992. OECD Guidelines for Testing Chemicals. Section 2. Effects on Biotic Systems: 203. Fish, Acute Toxicity Test. Adopted July 17, 1992.

Vincent, M. and J.P. Tassel. 1998. RPA 412708: Determination by High Performance Liquid Chromatography Analysis in Freshwater for Ecotoxicology. ANL/172-98E. Rhône-Poulenc Agro, Sophia Antipolis Research Center.